

# Model Driven Security (Extended Abstract)

David Basin  
ETH Zurich  
[www.infsec.ethz.ch/~basin](http://www.infsec.ethz.ch/~basin)

In [BDL03, LBD02] we have proposed Model Driven Security as a new approach to building secure systems. In Model Driven Security, designers specify high-level system models along with their security properties and use tools to automatically generate system architectures from the models, including complete, configured security infrastructures.

Model-driven system development is focused around the construction of high-level visual models. Under our approach, rather than fixing one particular modeling language for this process, we have proposed a schema for constructing such languages that combines languages for modeling systems with languages for modeling security. We present different instances of this general schema, which combine different UML-like modeling languages with a security modeling language for formalizing access control requirements.

The generation part of Model Driven Security is based on, and builds upon, the idea of Model Driven Architecture, which is an emerging standard for model-centric, generative software development. Our work provides concrete examples of this paradigm. For example, from high-level models specifying designs along with their access control policies, we can automatically generate security architectures for distributed applications, built from declarative and programmatic access control mechanisms. Overall, the modeling languages and generation process are semantically well-founded and hence one can reason about application security at the model level and even about the transformation process itself.

Initial experience with this approach using support tools suggests that Model Driven Security both simplifies the system development process and substantially improves the quality and maintainability of the resulting systems.

## References

- [BDL03] David Basin, Jürgen Doser, and Torsten Lodderstedt. Model driven security for process-oriented systems. In *Proceedings of the Eighth ACM Symposium on Access Control Models and Technologies (SACMAT 2003)*, pages 100–109. ACM Press, June 2003.
- [LBD02] Torsten Lodderstedt, David Basin, and Jürgen Doser. SecureUML: A UML-based modeling language for model-driven security. In *The unified modeling language: model engineering, concepts, and tools; 5th international*, volume 2460, pages 426–441. Springer, 2002.